REMARKS

The Applicant has filed the present Response in reply to the outstanding Official Action of February 4, 2005, and the Applicant believes the Response to be fully responsive to the Official Action for the reasons set forth below in greater detail.

At the outset, prior to addressing the rejections over the prior art, the Applicant calls to the Examiner's attention that Claims 1, 3, 6, 15, 17 and 20 have been amended. Claims 1, 3, 15, and 17, have been amended to overcome the Examiner's objections. Additionally, Claims 6 and 20 have been amended to clarify the function of the second comparison means.

Applicant would also like to note that Claims 29 and 30 have been added to the application. Applicant respectfully requests the Examiner to examine these new claims. The claims are similar to independent Claims 1 and 15, respectively. Applicant submits that the claims are patentable for the reasons set forth in detail below.

Additionally, the Applicant would like to thank the Examiner for taking the time to have a telephonic interview with Applicant's attorneys to discuss the § 102 and § 103 rejections.

In the outstanding Official Action, the Examiner rejected Claims 3 and 17 under 35 U.S.C. § 102(e) as being anticipated by Fujii et al., United States Patent No. 5,991,344 (hereinafter "Fujii"). Applicant respectfully disagrees with the Examiner's rejection and traverses with at least the following analysis.

Fujii does not teach the claimed structure or function. Fujii does not teach a phase shifter or a comparing portion as recited in Claim 3. Furthermore, Fujii fails to teach (i)

comparing said known signal serial converted by said P/S converter with said known signal inserted at transmission; and (ii) varying a phase shift of said base band signal before digital conversion by said A/D converting means on the basis of a result of said comparing, as recited in Claim 17.

The Examiner asserts that Fujii discloses a demodulation circuit wherein a known signal is inserted in the digital transmission signal before transmission and where the circuit comprises an A/D converter and a phase shifting means for causing a shift of one of the digital transmission signal and said base band signal on the basis of a known signal.

Fujii appears to disclose a demodulator for demodulating a signal having a unique word inserted at transmission, detecting the unique word, storing the frequency offset of the unique word and setting as the initial value of the automatic frequency control means the **frequency offset value** that was stored in the storage means.

Fujii states that a unique word with a **specified frequency** is sent from the interface tester which initiates a **frequency sweep processing** for setting an AFC (automatic frequency control) initial value. When a frequency sweep is executed for a plurality of time for the same channel, either the average of the result or the majority value is selected as the AFC initial value.

The AFC acts as a control signal. "As a result, the frequency signal output from the voltage controlled oscillator at frequency synchronization, that is, when the range of frequency error is within plus-or-minus $\pi/4$ of the reference phase, is input to the first local oscillator and the output from the first local oscillator is sent via transmitter-side mixer and up-converted, thus enabling the sending of a transmission signal **based on a**

specified range of frequencies that satisfy the specifications for technical standards." See Col 10, lines 37-46.

Fujii adjusts the frequency of the receiving device in order to receive the unique word. Additionally, when the initial SW detector 312 detects a "1" in two MSBs, the synchronization detector detects the unique words and notifies the controller of the detection.

In stark contrast, the claimed invention as recited in Claim 3 has a **phase shifting means** including P/S converter for digital signal outputted by the symbol judgment portion, a **comparing portion for comparing said digital signal serial converted by said P/S converter with said known signal inserted at transmission** and a **phase shifter** for **repeatedly varying a phase shift** of said base band signal before digital conversion by said A/D converting means on the basis of a result of comparison by said comparing portion. An example of this comparison can be found on pages 12-15 of the specification.

AFC control and frequency sweeping are quite different from a phase shift.

Concretely, the frequency of the prior art demodulator is tuned with respect to the reception signal; however, the output of the demodulators are not controlled so as to be optimized with the phase of the sampling signal. Accordingly, although the frequency of the oscillator of the demodulator can be controlled, the output of the demodulator cannot be controlled appropriately for the sampling of the A/D converter. Therefore, since the relationship between the phase of the sampling signal and the phase of the input signal of the A/D converter cannot be controlled optimally, the quality of the A/D conversion is degraded if the sampling frequency is low and results in incorrect A/D conversion. If one

of ordinary skill in the art would apply the teachings of Fujii to a high frequency receiver, the sampling frequency would be very high to insure appropriate A/D conversion.

Furthermore, Applicant respectfully disagrees with the Examiner that it is inherent in the reference that "a comparison needs to be made between the received signal and a unique word stored in the receiver." See Page 5 of Official Action. Fujii solely detects the unique word when a 1 is detected in the two MSBs. There is no reference to a signal stored in the receiver or a reference to a comparison. Fujii teaches that once a predetermined threshold value has been reached, i.e. 1 is detected in the two MSBs, the unique word is detected. The unique word detector or synchronization detector is not equivalent to the claimed comparing portion, as described in the specification at pages 12-15.

In the disclosed embodiment, a **comparison portion** compares the digital signal converted by said P/S converter with a known signal inserted at transmission. The phase shift control portion outputs a phase shifting amount to the phase shifters **on the basis of the results of the comparison.** The reference is silent as to the basis for the frequency sweep.

Therefore, Fujii fails to teach each and every limitation of the claims and, thus, the claims are not anticipated.

The Examiner rejected Claims 4 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Fujii in view of Miya et al. (U.S. Patent No. 5,572,516) (hereinafter "Miya"). Applicant respectfully disagrees with the Examiner's rejection based upon the above-identified analysis. Miya does not remove any of the above-identified deficiencies.

The Examiner rejected Claims 1, 2, 5, 9, 15, 16, 19 and 23 under 35 U.S.C. § 103(a) as being unpatentable over Tarallo (U. S. Patent No. 4,879,728) in view of Horii et al. WO 98/56148 (hereinafter "Horii").

The Examiner avers that Tarallo teaches the demodulation circuit where a known signal is inserted in the transmission signal, an A/D converting means, and a phase shifting means. The Examiner also asserts that Horii teaches a P/S converter. Accordingly, the Examiner concludes that it would be obvious to a person of ordinary skill in the art at the time that the invention was made to recognize that a P/S conversion means can be used within the symbol decision circuit 145 to facilitate the generation of the output symbol.

Applicant respectfully disagrees with the Examiner's rejection and traverses with at least the following analysis. Similar to Fujii, Tarallo teaches frequency adjustment or frequency control AFC, and not a phase shift.

Accordingly, Tarallo fails to teach a phase shifting means for repeatedly varying a phase shift of one of said digital transmission signal and said base band signal before digital conversion by said A/D converting means on the basis of a comparison between said known signal after digital conversion by said A/D converting means and prior to a P/S conversion and said known signal that was inserted at transmission as specifically recited in Claim 1. Similar limitations appear in the corresponding method Claim 15.

Tarallo teaches that inphase different component signals of the symbols of the preamble interval are compared with the quadrature difference component signals of the symbols of the preamble interval to generate a plurality of signals representative of a set of predetermined relationships between the inphase different component signals and the

quadrature phase difference component signals. See Abstract. ***The frequency of the receiver frequency source is adjusted responsive to the plurality of predetermined relationships signals.***

"Signals representing the phase differences between successive symbols in the preamble are formed and the frequency of the demodulator carrier source is modified according to the relative values of the inphase and quadrature components of the phase difference signals." See Col. 2, lines 63-67. The inphase component of the phase differences between immediately successive received symbols and the quadrature component of the phase differences between immediately successive received symbols are produced. Additionally, at least one signal indicative of the values of the inphase I component phase difference signals relative to the values of the quadrature phase Q component phase difference signals in the preamble interval is generated. The **frequency** of the demodulator frequency source is set responsive to the at least one relative value indicative signal.

The reference further states, "in order to demodulate a received signal, it is only necessary to determine the phase shift from symbol period to symbol period so that coherent carrier detection required to determine the absolute phase of the received signal as in PSK arrangements may be avoided." Therefore, the local oscillator frequency is synchronized to that of the received carrier frequency by processing the detected symbols of a prescribed symbol sequence during a predetermined preamble interval.

Successive symbols of a preamble period may be detected and used to adjust the frequency of the local oscillator without regard to the times at which the symbols in the received signal are sampled as long as the sampling rate corresponds to the symbol

period. ***I.sub.diff and Q.sub.diff signals are obtained from differential detector 140 and are applied to AFC carrier acquisition and tracking processor 155.*** These are used to determine the location of the phase shift corresponding to the prescribed symbol sequence. A signal corresponding to a difference between the location of the phase shift obtained from the I.sub.diff and Q.sub.diff signals is supplied to local oscillator 125. ***The frequency of local oscillator 125 is thereby altered to bring the received symbol phase shift into the proper quadrant.***

Additionally, I.sub.diff and Q.sub.diff signals are not the same as a comparison between said known signal after digital conversion by said A/D converting means and prior to a P/S conversion and said known signal.

Accordingly, Tarallo fails to teach a phase shifting means for repeatedly varying a phase shift of one of said digital transmission signal and said base band signal before digital conversion by said A/D converting means on the basis of a comparison between said known signal after digital conversion by said A/D converting means and prior to a P/S conversion and said known signal that was inserted at transmission.

Therefore, even if you would combine the references you would not achieve the claimed invention.

Additionally, there is no suggestion in the hypothetically combined references to compare the known signal after digital conversion by said A/D converting means and **prior to a P/S conversion** with the known signal. Nor is there any motivation to perform the comparison prior to P/S conversion.

Accordingly, the hypothetically combined system fails to teach, suggest or render obvious each and every limitation of the claims.

Claims 2, 5, 9, 16, 19 and 23 are patentably distinct from the cited references based upon their dependency from Claims 1 and 15, respectively, and based upon the above reasoning.

The Examiner also rejected Claims 10 and 24 under 35 U.S.C.§ 103(a) in view of Tarallo, in combination with Horii, Odenwalder et al. (U.S Patent No. 6,480,521) (hereinafter "Obenwalder") and Sawahashi et al. (U.S. Patent No. 5,694,388).

Claims 10 and 24 are patentably distinct from the cited reference based upon their dependency from Claims 1 and 15, respectively, and based upon the above reasoning. Applicant does not agree with the Examiner's assertion that Obenwalder and Sawahashi teach or disclose transmitting information data on one of the I and Q channels and the known signal (pilot signals) on the other as recited in Claims 10 and 24. At best, the hypothetically combined references teach that the pilot symbols and information data **can** be transmitted on separate channels and that a pilot signal can be transmitted on either an I or Q channel. Sawahashi states that "good tracking ability to the Raleigh fading can be achieved because the phase fluctuations in the propagation path is estimated without interruption using the pilot channel that continually transmits the pilot signal of a known pattern". See Sawahashi, Col. 29, lines 17-21. This only teaches that the pilot signal should be continually transmitted. Furthermore, Figure 12 does not suggest that the information data or the pilot channel is either the I or Q channels. In fact, the traffic channel (1-N) implies that there are more than two channels for transmission. Moreover, the reference does not suggest that the pilot channel should be orthogonal to the information data channel.

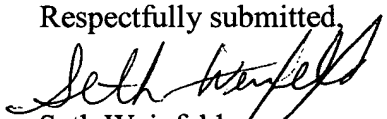
Additionally, Claims 29 and 30 are patentably distinct from the cited references for the same reasons as cited above.

Based upon the foregoing amendments and arguments, Applicant respectfully requests the Examiner to withdraw the rejection of Claims 6-8 and 20-22 under 35 U.S.C. § 112, first paragraph. Applicant also respectfully requests the Examiner to withdraw the rejection of Claims 3 and 17 under 35 U.S.C. § 102(e).

In addition, Applicant respectfully requests the Examiner to withdraw the rejections of Claim 1, 2, 4, 5, 8, 9, 10, 15, 16, 19, 23 and 24 under 35 U.S.C. 103(a) and the objection to the claims.

In conclusion, the Applicant believes that the above-identified application is in condition for allowance and henceforth respectfully solicits the Examiner to allow the application. If the Examiner believes a telephone conference might expedite the allowance of this application, the Applicant respectfully requests that the Examiner call the undersigned, Applicant's attorney, at the following telephone number: (516) 742-4343.

Respectfully submitted,



Seth Weinfeld
Registration No: 50,929

SCULLY, SCOTT, MURPHY & PRESSER
400 Garden City Plaza, Suite 300
Garden City, New York 11530
Telephone: (516) 742-4343

SW:ae